

# ESSENTIAL ELEMENTS SUMMARY

During Workshop 5, we heard many comments that certain actions included in all the alternatives need to be implemented at levels higher than those represented in the core actions. For example, increased levels of demand management, more levee improvements, and more habitat above the core levels of implementation should be included in all alternatives. The term "essential elements" was suggested for a set of actions that was viewed by most to be essential to the success of any alternative. The essential elements should not be confused with the core actions since they are not subject to the same criteria as presented above for the core actions. These should be viewed as a starting set of actions which build upon the core actions to facilitate early stages of Program implementation.

*Note: The activities listed here represent essential elements that occur throughout all alternatives.*

## Physical and Structural Features

### Habitat Restoration

Activities	Benefits
<ul style="list-style-type: none"> <li>• Restore <b>shallow water</b> (tidal) habitat in the Delta.</li> <li>• Convert 800 to 1,200 acres of existing leveed lands to tidal actions.</li> <li>• Include shallow water habitat in reconstruction of 50 to 100 miles of levees (coordinate with <i>Flood Protection and Levee Stabilization</i> activities).</li> </ul>	<ul style="list-style-type: none"> <li>• Improves shallow water aquatic habitat.</li> <li>• Increases the availability of forage, spawning, and rearing habitats and escape cover for: <ul style="list-style-type: none"> <li>• juvenile salmon</li> <li>• Delta smelt</li> <li>• splittail</li> <li>• other resident and anadromous fish</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• Restore <b>Delta riparian habitat</b>.</li> <li>• Improve riparian conditions on 75 to 125 acres of degraded riparian lands above the 200 to 400 acres improved through Core Action activities.</li> <li>• Establish new areas of riparian habitat through acquisition of 400 to 600 acres of riparian land.</li> </ul>	<ul style="list-style-type: none"> <li>• Increases the availability of riparian habitat.</li> <li>• Improves the quality of riparian habitat within the Delta.</li> <li>• Increases availability of shade and cover habitats for aquatic species.</li> <li>• Provides spawning habitat for native and non-native fish.</li> <li>• Improves rearing habitat for salmon and other species.</li> </ul>

Activities	Benefits
<ul style="list-style-type: none"> <li>• Restoration of <b>Suisun Bay habitat</b>.               <ul style="list-style-type: none"> <li>• Restore 750 to 1,250 acres to tidal wetland habitat.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Provides wet year spawning habitat for Delta smelt.</li> <li>• Provides rearing areas for salmon.</li> <li>• Provides waterfowl and wildlife habitat (e.g. canvasback and redhead ducks).</li> </ul>
<ul style="list-style-type: none"> <li>• Restore <b>riverine habitat</b> on the <b>Sacramento River</b> between Verona and Collinsville and along <b>Delta channels</b>.               <ul style="list-style-type: none"> <li>• Reconstruct river banks and shallow water habitat on 50 to 75 miles of leveed banks along the Sacramento River.</li> <li>• Protect and enhance 300 to 500 acres of riverine habitats on channel islands above the 500 to 1,000 acres protected through Core Action activities.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Increases spawning and rearing habitat for:               <ul style="list-style-type: none"> <li>• chinook salmon</li> <li>• Delta smelt</li> <li>• steelhead</li> <li>• splittail</li> <li>• striped bass</li> <li>• other native and non-native fish species</li> </ul> </li> <li>• Increases availability of riparian-shoreline habitat for forage, escape, and cover areas for the aquatic and terrestrial species.</li> </ul>
<ul style="list-style-type: none"> <li>• Restoration of <b>floodway corridor habitat</b>.               <ul style="list-style-type: none"> <li>• Modify floodways to convert 5,000 to 7,000 acres of production agricultural lands to wetland habitat.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Provides spawning areas for Delta native fish.</li> <li>• Improves wildlife habitat.</li> <li>• Improves forage areas and escape cover for:               <ul style="list-style-type: none"> <li>• juvenile salmon</li> <li>• Delta smelt</li> <li>• splittail</li> <li>• other native and non-native fish species</li> </ul> </li> </ul>
Considerations	
<ul style="list-style-type: none"> <li>• <b>Delta Shallow Water Habitat</b> – Candidate areas for restoration include Prospect Island, Liberty Island, Little Holland Tract, Hastings Tract, Yolo Bypass, and the southeast Delta.</li> <li>• <b>Delta Levee Habitat</b> – Candidate levees for restoration include Twitchell Island along Threemile Slough and Sevenmile Slough, Georgiana Slough, and the North and South Forks of the Mokelumne River.</li> <li>• <b>Floodway Corridors</b> – Habitat restoration must not impair capacity of floodway.</li> <li>• <b>Suisun Bay</b> – Create tidal wetlands with dredge spoils between Collinsville and Carquinez Strait or convert diked wetlands to tidal wetlands.</li> <li>• <b>Riparian Habitat</b> – Coordinate with <i>Flood Protection and Levee Stabilization</i> actions.</li> </ul>	

**Fish Protection and Transport**

Activities	Benefits
<ul style="list-style-type: none"> <li>Continue to evaluate acoustic barrier at <b>Delta Cross Channel</b> to block outmigrating fish from entering the interior Delta.</li> </ul>	<ul style="list-style-type: none"> <li>Increases fish survival.</li> <li>Improves operational flexibility of facility.</li> </ul>
<b>Considerations</b>	

**Flood Protection and Levee Stabilization**

Activities	Benefits
<ul style="list-style-type: none"> <li>Implement a comprehensive <b>Delta Long-Term Protection Plan</b> at a moderate level.</li> <li>For levee maintenance and stabilization actions to attain and maintain a uniform standard at or above the Hazard Mitigation Plan also to include recommended funding to improve 140 to 180 miles of levees currently below the HMP standard.</li> </ul>	<ul style="list-style-type: none"> <li>Reduces vulnerability of Delta land use and infrastructure to inundation</li> <li>Reduces vulnerability of Delta water quality to salinity intrusion</li> <li>Reduces vulnerability of Delta ecosystem functions to salinity intrusion and inundation</li> <li>Provides greater opportunities for habitat restoration</li> </ul>
<b>Considerations</b>	
<ul style="list-style-type: none"> <li>Integrate protection and stabilization of levees with Delta habitat restoration activities.</li> </ul>	

**Operational and Management Features****Water Supply Management**

Activities	Benefits
<ul style="list-style-type: none"> <li>Encourage temporary <b>land fallowing</b> during drought periods to reduce dry year demand by approximately 100,000 to 300,000 AF through use of incentives and other programs.</li> <li>Permanently <b>retire</b> approximately 70,000 to 100,000 acres of marginally producing <b>agricultural lands</b> and lands from willing sellers through use of incentives and land purchases.</li> </ul>	<ul style="list-style-type: none"> <li>Reduced demand for Delta water exports.</li> <li>Could make water available for transfers.</li> <li>Provides water quality benefits in the San Joaquin River and south Delta by retiring lands that contribute to drainage problems along the San Joaquin River.</li> <li>Reduces slightly the total salt load to the San Joaquin Valley.</li> </ul>

Activities	Benefits
<ul style="list-style-type: none"> <li>• Expand <b>groundwater banking and conjunctive use</b> in Delta export areas such as the San Joaquin Valley and the Tulare Lake Basin and in the Sacramento Valley.</li> </ul>	<ul style="list-style-type: none"> <li>• Improves operational flexibility of Delta exports.</li> <li>• Allows a portion of Delta exports to be shifted away from fish sensitive periods.</li> <li>• Could make water available for transfers.</li> <li>• Reduces fish entrainment at Delta pumping facilities.</li> </ul>
<ul style="list-style-type: none"> <li>• Increase the implementation of <b>municipal and industrial water conservation</b> to reduce demand by 100,000 to 200,000 AF over current implementation commitments.</li> <li>• Use incentives or other means to achieve implementation of Best Management Practices (BMP's) by more suppliers and water users.</li> <li>• Expand the BMP's to include additional practices and higher implementation rates.</li> <li>• Increase the level of <b>agricultural water conservation</b> to reduce demand by an additional 100,000 to 200,000 AF.</li> <li>• Use incentives or other means to achieve implementation of Efficient Water Management Practices (EWMP's) by more suppliers and water users.</li> <li>• Expand the EWMP's to include additional practices.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduces overall water demand.</li> <li>• Could make water available for transfers.</li> <li>• May improve overall Delta and tributary water quality through retention of agricultural drainage water for release when pulse flows can provide dilution.</li> </ul>
<ul style="list-style-type: none"> <li>• Develop an incentive driven program to modify <b>upstream reservoir releases</b> on all tributaries to maximize coordination with water quality, fish and wildlife, and water supply needs.</li> </ul>	<ul style="list-style-type: none"> <li>• Improves flexibility of system operations.</li> <li>• Increases water supply reliability.</li> </ul>
Considerations	
<ul style="list-style-type: none"> <li>• Emphasis for land retirement will be placed on land which contributes to regional drainage problems and/or is marginally productive. In-Delta land retirement can reduce diversion effects, assist with actions to control subsidence, and improve water quality.</li> <li>• Maximize the potential for temporary fallowing (such as rotational fallowing). Land fallowing upstream of the Delta may reduce Delta inflows and may also be available for use in water transfers.</li> <li>• Conjunctive use and groundwater storage programs can include in-lieu operations which focus on providing adequate deliveries of surface water in wet years and lower deliveries in dry years. Groundwater stored south of the Delta would be used in-lieu of surface deliveries during dry years and seasonally to marginally offset Delta exports during fish sensitive periods.</li> <li>• Agricultural conservation values shown only include conservation of water lost to salt sinks or other degraded bodies of water which are not reusable.</li> </ul>	

**Water Diversion Management**

Activities	Benefits
<ul style="list-style-type: none"> <li>• Acquire about 100,000 AF of water from willing sellers in the San Joaquin Valley or develop from expanded surface water or groundwater storage.</li> </ul>	<ul style="list-style-type: none"> <li>• Transports fish through the San Joaquin River and Delta.</li> <li>• Improves water quality.</li> <li>• Improves management flexibility for diversions to reduce fish losses.</li> </ul>
<ul style="list-style-type: none"> <li>• Improve CVP and SWP operations through predation control and coordinating operations.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduces fish losses due to predation.</li> <li>• Improves CVP/SWP coordinated operations to include "joint point of diversions and use." Allows water pumped by either project to be used by both projects.</li> </ul>
<ul style="list-style-type: none"> <li>• Improve real-time monitoring for presence of fish species of special concern and modify water diversions to avoid fish entrainment.</li> </ul>	<ul style="list-style-type: none"> <li>• Provides an additional tool to help reduce entrainment of special-concern species.</li> <li>• Improves flexibility to divert water during critical fish migration periods.</li> </ul>
<b>Considerations</b>	
<ul style="list-style-type: none"> <li>• Improve CVP/SWP coordinated operations to include "joint point of diversion and use". Allows water pumped by either project to be used by both project users.</li> </ul>	

**Fisheries Management**

Activities	Benefits
<ul style="list-style-type: none"> <li>• Mark salmon produced in hatcheries.</li> </ul>	<ul style="list-style-type: none"> <li>• Facilitates selective catch of hatchery salmon by commercial and recreational fisheries.</li> </ul>
<b>Considerations</b>	
<ul style="list-style-type: none"> <li>• Actions are intended to maintain recreational and commercial fisheries as well as enhance native salmon stocks.</li> <li>• Need to assess impact of incidental mortality on native (unmarked) fish.</li> </ul>	

**Water Quality Management**

Activities	Benefits
<ul style="list-style-type: none"> <li>• Manage drainage timing (i.e., restrict drainage discharges by 15 to 25 percent during periods of low Delta inflow) to reduce instream impacts of water quality.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduces the concentration of pollutants entering the Delta and its tributaries during low flow periods and allows better coordination of discharges and dilution flows.</li> </ul>
<ul style="list-style-type: none"> <li>• Improve management of urban stormwater runoff to retain an additional 15 to 25 percent of runoff volume.</li> </ul>	<ul style="list-style-type: none"> <li>• Improves Delta water quality by reducing the volume of urban stormwater runoff and concentration of pollutants entering Delta tributaries.</li> </ul>

Activities	Benefits
<ul style="list-style-type: none"> <li>• <b>Construct wetlands</b> to treat 3,000 to 5,000 AF of upstream wastewater effluent and Delta agricultural drainage.</li> </ul>	<ul style="list-style-type: none"> <li>• Improves Delta water quality by allowing some filtration and reduction in biological oxygen demand to result from constructed wetland treatment.</li> </ul>
<ul style="list-style-type: none"> <li>• Increase enforcement of source control regulations for <b>agricultural drainage</b> to modestly: <ul style="list-style-type: none"> <li>• Reduce leachate concentrations and volumes.</li> <li>• Restrict spray programs adjacent to waterways.</li> <li>• Reduce runoff volumes.</li> <li>• Reduce the concentrations of pollutants in runoff.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Reduces in-Delta and tributary surface water concentrations of pesticides (herbicides, fumigants, fungicides), fertilizers, concentrated mineral salts, and microbial agents from agricultural drainage.</li> </ul>
<ul style="list-style-type: none"> <li>• Implement moderate on-site <b>mine drainage remediation</b> measures developed in site specific studies at the Walker Mine, Malakoff Diggins, Leviathon Mine, Iron Mountain Mine and Penn Mine sites, and control runoff from those and other high priority mine sites based on current water quality objectives for pollutants.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduces future tributary and Delta heavy metals loading.</li> </ul>
Considerations	
<ul style="list-style-type: none"> <li>• Identify priority sources and provide regulatory and economically effective institutional incentives for implementation.</li> <li>• Remediation actions should include consideration of surface regrading, revegetation, and hydraulic works for infiltration control, and mine drainage handling (e.g. discharge reuse, evaporation ponding, regulated discharge, rerouting) and treatment (e.g. mine sealing, limestone neutralization, etc.)</li> <li>• Evaluate potential to give urban areas flexibility to fund high priority mine remediation in-lieu of increasing expenditures on wastewater treatment plant improvements.</li> </ul>	

### Management of System Vulnerability

Activities	Benefits
<ul style="list-style-type: none"> <li>• Establish <b>landside buffer zones</b> adjacent to some levees on islands with deep peat soils.</li> </ul>	<ul style="list-style-type: none"> <li>• Buffer zones provide an increase in stability of adjacent levees.</li> <li>• Conversion to wetlands provides long-term increases in stability of Delta levees and reliability of Delta functions by reversing subsidence.</li> </ul>

Activities	Benefits
<ul style="list-style-type: none"> <li>Establish and recommend modest funding for an <b>emergency levee management program</b> which provides funding and direction for reclaiming Delta islands in the event of levee failures and for the continued protection of Delta functions.</li> <li>Identify funding sources for <b>continuing levee maintenance</b> activities beyond the planning horizon of the program.</li> <li>Identify funding sources for a continuing levee stabilization program which will work beyond the planning horizon of this program toward improving all important Delta levees to a P.L. 99 standard.</li> </ul>	<ul style="list-style-type: none"> <li>Ensures suitable funding, equipment and materials availability, and coordination to rapidly respond to levee failures.</li> <li>Provides funding for continued maintenance of levees to protect Delta functions.</li> <li>Increases the reliability for water supply needs from the Delta.</li> </ul>
Considerations	
<ul style="list-style-type: none"> <li>Determine extent and cost effectiveness of levee improvements and buffer zone programs.</li> <li>Buffer zones may be managed to provide wildlife habitat.</li> <li>Emergency levee management program would not replace other levee maintenance or improvement programs.</li> <li>Levee maintenance funding would be based upon continuation, possibly at a slightly higher level, of a program like the SB 34 program, which currently funds maintenance activities. SB 34 is set to expire in 1997.</li> </ul>	

## Institutional and Policy Features

### Habitat Programs

Activities	Benefits
<ul style="list-style-type: none"> <li>Integrate recommended <b>habitat restoration actions from other federal and state programs</b>, including the Anadromous Fish Restoration Program.</li> <li>Establish a CALFED Regulatory Team to coordinate and <b>expedite habitat restoration permits</b>.</li> </ul>	<ul style="list-style-type: none"> <li>Provides additional habitat restoration.</li> <li>Provides coordination between habitat restoration programs.</li> <li>Accelerates acquisition of permits for environmental restoration projects and other CALFED projects.</li> </ul>
Considerations	
<ul style="list-style-type: none"> <li>Coordinate activities to avoid duplication.</li> <li>CALFED Regulatory Team would be comprised of key personnel from each CALFED member agency.</li> </ul>	

## Water Supply Management

Activities	Benefits
<ul style="list-style-type: none"> <li>• <b>Long-term planning for drought contingencies.</b> <ul style="list-style-type: none"> <li>• Create a coordinated CALFED program to expedite and expand the use of <b>water transfers</b> to meet water needs during droughts.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Improve drought response planning.</li> <li>• Increases water supply reliability.</li> <li>• Can be integrated with conjunctive use programs.</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Ease institutional barriers</b> to facilitate water transfers.</li> <li>• <b>Improve planning and coordination</b> procedures for water transfers.</li> <li>• <b>Improve operational procedures</b> to facilitate water transfers.</li> <li>• Establish a water transfer <b>brokering mechanism</b> or institution.</li> </ul>	<ul style="list-style-type: none"> <li>• Increases the efficiency of implementing water transfers.</li> <li>• Increases financial position of otherwise economically marginal projects that increase water supply flexibility.</li> <li>• Increase water supply reliability and predictability.</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Improve coordination of land use and water supply planning.</b> <ul style="list-style-type: none"> <li>• Develop incentives for local and regional coordination of land use and water supply planning.</li> <li>• Implement long-term institutional measures to increase coordination of state/federal project planning and operations with local and regional water planning and operations.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Provides greater flexibility for short-term transfer water during drought contingencies.</li> <li>• Increases the efficiency of water supply planning.</li> <li>• Ensures beneficial uses of existing water supplies.</li> </ul>
Considerations	
<ul style="list-style-type: none"> <li>• Determine institutional needs to implement long-term drought planning programs</li> <li>• Determine institutional requirements for augmenting California Water Codes to facilitate water transfer procedures.</li> <li>• Evaluate the use of a Delta central planning institution to manage inflows, transfers, export operations, and outflows.</li> </ul>	